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The impact of m-learning activities on the it success and m-learning capabilities of the special education teacher candidates

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Abstract

The advantages of using mobile devices and cloud computing services in education are accepted by many researchers. Also, in educating students who are in need of special education, the use of cloud computing services is inevitable. So, this case requires teacher candidates who are planning to teach in those special education centers to be able to use these technologies sufficiently, be able to perceive positively and in order to be able to follow future improvements and innovations. Therefore, the aim of this study is to identify the perceptions of teacher candidates' mobile learning implementations that are supported by cloud computing services towards mobile learning. This is an experimental study. Study group consists of 56 teacher candidates from special education department. Lessons are lectured in a blended learning environment of SkyDrive cloud with a variety of materials. Pre-test and post-test results of the students in terms of using mobile tools in mobile learning environment, success in information technology.

Keywords: Mobile Learning, Cloud Computing, Information Technologies

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1. Introduction

The influence of technology that has a remarkable place in educational environments has increased when united with the internet and mobile technologies (Wang, Doll, Deng, Park & Yang, 2013). According to Moreno and Saldano (2005) the use of the internet in the education of the mentally disadvantaged is not new. They used to use videos and some other electronic devices. Tsang, Lee, Yeung, Siu, and Lam (2007) in their experimental study found that the mentally disadvantaged individuals benefit from those technologies at a maximum level after they receive education on information and communication technologies. Parsons, Daniels, Porter and Robertson (2008) whereas mentioned in their study that technology could not be used with full potential in the area of special education. Kuzu, Cavkaytar, Cankaya and Oncul (2013), on the other hand, consider that poor knowledge about the support of technology, missing knowledge relating to blending and limited viewpoints of teachers have impact on this. For the mentally disadvantaged individuals to be able to benefit from the information technologies at a maximum level, principally, teachers should be good users of those technologies and they should be able to follow innovations in their professions. They, also, should be able to benefit from information and communication technologies.

Along with the developing technology, education has also witnessed a number of changes. It is essential and quite necessary to blend technology with education, support it with new technologies and develop creative solutions in order to improve it more by frequently measuring how beneficial it is for education (Jones, Scanlon & Clough, 2013; Lopez, Fortiz, Almendros & Martinez, 2013). It is crucial to help learners to reach the information without depending on time and place, to prepare right settings for these activities, to offer education and instruction that is blended with technology and to train teachers who are specialized in those areas (MEB, 2005. Different learning environments and contents are needed for the individuals who learn and teach. This will connect individuals to each other for education in different places and times with the help of technology (Ozdamli, 2011; Ozdamli, Soykan & Yildiz, 2012; Yengin, Ince, Karahoca, Karahoca & Uzunboylu, 2012).

It is possible to say that benefits of mobile learning can be summarized as more flexible, accessible and personalised learning activities (Dewitt & Siraj, 2011). As a main objective of mobile learning, it is needed to increase the effectiveness of teaching method and strategies of computer based teaching materials rather than transferring them into mobile devices. By this way, it can be expected learners to become a broader range and increase their productivity. Computers, mobile devices and the Internet connection of the rapid growth in mobile learning are made great changes with concept of education (Lu, Ting, Little & Murphy, 2013; Ahmed & Parsons, 2013).

Besides all these, with the digital and technological capabilities which are the most important properties that teachers are supposed to have, individuals could reach the information on their own and could improve themselves about their interests. However, it is interesting that the field of special education has digital and technological capabilities at the lowest level. Teachers in this field have the lowest level of capability in using the technology comparing to the other fields. Therefore, it is thought to make the future candidate teachers of special education field gain these properties and also make them use these properties in certain activities.

Students studying in the department of teaching for the mentally disadvantaged should be educated equally well in every area. Due to this principle as well as all the reasons mentioned above, there appeared a necessity to carry out a study in order to find out about the impact that the mobile learning implementations and its effects on the mobile learning capabilities towards department of teaching for the mentally disadvantaged.

1.1. Aim of the Research

In this current study it is aimed to identify the impact of candidate teachers' who are the future teachers of children in need of special education, success of m-learning supported course of information technologies, mobile learning capabilities.

In order to reach this aim, the following sub aims are clarified:

1. To find out whether there is a change or not at the end of the mobile supported implementations in the students of teaching for mentally disadvantaged towards their success level of information technologies.
2. To find out whether the candidate teachers' mobile learning capabilities and perceptions influenced or not at the end of the mobile supported studies.
3. To find out what the candidate teachers' views are both on the study carried out and the setting used.

2. Method

The current study is an experimental one in nature and designed according to single group pre-test and post-test research model. The course of Information Technologies is taken by the students of the Department of Teaching for the Mentally Disadvantaged which was opened in 2012-2013 academic year at the Near East University. With the opening of the department, this study was carried out with all the students. Demographic information of the candidate teachers of the Department of Teaching for the Mentally Disadvantaged is as given below:

58.9% (33 males) of the participants were male and 41.1% (23 females) were female candidate teachers. The number of both male and female students studying in the Department of Teaching for the Mentally Disadvantaged is close to each other. The average age of the group is calculated as 19.5. In the preliminary test done, it was found out that all the members of the study group had at least one mobile device and 71.4% (40 students) of the group members had internet connection on their mobile phones.

2.1. Data Collection Instruments

In this current study, with a purpose of enriching the whole work, both qualitative and quantitative methods were used to collect the data. In order to determine students' competencies towards mobile learning the "Mobile Learning Scale" (with Cronbach value=.950) that was developed by Ozdamli (2011) was used.

A 50 question achievement test that covers all the subjects was developed in order to assess candidate teachers' knowledge before and after study. Among the 50 questions, there are 10 which were about the whole fall term as well as the seminars organized every other week. The developed test was given to 100 candidate teachers for the item difficulty analysis to be done. According to the result of the item difficulty analysis, questions over 0.30 were taken into the test.

Besides, according to the results of the questionnaires that were conducted to determine candidate teachers' competence perceptions towards mobile learning, semi-structured interviews were developed to take the views on the usability of the setting and to increase their competencies of mobile learning and to find out how these competencies could be strengthen. The form is composed of 7 questions. In order to maintain the validity of the interview's content, the questions were prepared by the researcher. 10 field experts were consulted and the necessary modifications were made to the interview form used in the light of their recommendations.

2.2. Design of Mobile Supported Environment

The current study is based on cloud computing system that could easily be used through mobile devices. Cloud systems are the possibility of any to be accessible over the Internet. The most significant characteristic of cloud system is to enable users to use it over any mobile device without having a lot of technical skills and paying anything. It is not a device dependent system and could work without the Internet. Also, cloud systems could make work over portable as well as non-portable devices. There are security precautions for users and if they prefer, they could choose to make their files accessible just for themselves within the cloud system or they could choose to share them with their group friends. The system accepts unlimited users. If there is a need, the information could be synchronized and made accessible through the connection of the Internet over the other devices (Ozdamli, 2013). Users could have an access for the cloud system at any time from any place. There are a number of cloud systems over the Internet.

In this study, SkyDrive cloud system is used. The reason why SkyDrive was preferred to be used is that it gives students the opportunity of working in groups. SkyDrive system has a cross platform that enables its use on desktop computers and mobile devices. SkyDrive is a well-known cloud storage service from Microsoft. It was providing free online storage for Windows Live users. It also provides more opportunities than other cloud systems do. For example, SkyDrive offers 25 GB of storage space to all users for free whereas Amazon S3 offers 5 GB for one year it is free for new users and unlimited space in a successive pay-per-use offer (Spillner, Müller and Schi, 2013). Microsoft has made SkyDrive interface more eye-candy and user-friendly.

2.3. Implementation

The implementation process of the study took 10 week time during the spring term of 2012 and 2013 academic year. Before starting the implementation, students were given the pre-tests online at the laboratory atmosphere. Lessons during the implementation process were carried out both online and offline. The first 3 weeks of the study, for the candidate teachers to be able to effectively use and control their projects that would be created in the SkyDrive, the lessons were carried out in the laboratories within the context of the Information Technologies by dealing with Mobile Technologies and Mobile Applications. In this study, groups were formed for students' projects. All the materials in the groups formed loaded into the cloud area and thus were made accessible for the rest of the group members.

In the cloud created offline, subject related presentations, videos and course notes were also added and students had easy access for them. Students received help by downloading those course notes in their computers wherever they had problems.

Throughout the study, students and their teacher met once a week at a certain time arranged in advance in order to find solutions to the problems students face by means of chatting environment supported by the SkyDrive. Using this chatting environment, students received feedback by making a rapid contact with both their teacher and their group friends at the same time. Besides, information is given on the intended use of the SkyDrive that would be used as a mobile supported learning environment and how it would be used in the project. Additionally, the candidate teachers are also informed about the reasons of why this program is used and what advantages it provides.

In the 4th and 5th weeks, a trial study is carried out with the candidate teachers in a laboratory. All the candidate teachers gained experience by entering the SkyDrive using their user information about the characteristics of the environment and its usage.

At the end of the lecture, the candidate teachers are asked to form their groups that they would apply their study and each group is left free to choose a subject according to their interest areas. Surely, these subjects should be confirmed by the teacher since there are certain criteria. Because it is aimed to get the information not directly from the Internet but actively seeing as well as coding the

information on their own from the life and share it with their group friends. This is how the implementation gained meaning, supposedly.

Before starting the project process, each group is distributed the duties within itself by exchanging the information. Thus, teacher candidates learned how to work collaboratively besides mobile supported learning. Additionally, it is paid great attention to provide each group with different mobile devices in order to make the implementation more meaningful and beneficial. It is arranged in a way that each group would have a teacher using at least two smart phones. In the application, each group is given the same subjects. The formed project groups and the subjects are: Autism, Down Syndrome, Hearing Impaired People, Visually Impaired People, Attention Deficit and Hyperactivity, Learning Difficulty and Gifted People.

Within the scope of this study, the students have found the opportunity of sharing voice and video documents that were collected according to their interests on SkyDrive after doing certain arrangements.

In the 6th, 7th, 8th and 9th weeks, all the group members searched for sources relevant to their subjects in the guidance of their teachers. For example, the group working on the Autism and Down Syndrome went to the Nicosia Special Education Centre and had an examination of the place, had interviews with the families of these people and collected information from the teachers at school on one to one basis (Figure 1).

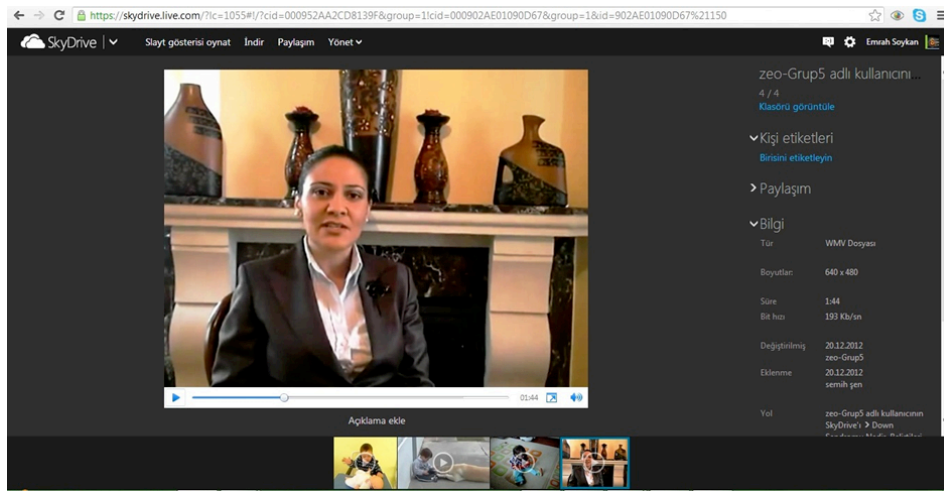


Figure 1. The Video of the Interview with the Family of the Disabled

All these activities are shared with the other group friends and thus the permanence of the information is increased. In addition, they had broad knowledge about this subject, discussed the problems they experienced, shared the photos and videos taken.

Students dealing with the Down syndrome went to the Special Education Centre and had meetings with both students and teachers, arranged activities and spent some time with them. The candidate teachers loaded the experiences and knowledge gained and photos and videos to the SkyDrive and thus shared with each other (Figure 2).

Student group dealing with the Hearing Impaired ones loaded the special computer program on their mobile devices from the Internet and tried to teach those children how to use these applications and then had a discussion on the problems they faced in this process.



Figure 2. The Candidate Teachers with the Down Syndrome Students at the Special Education Centre

The teacher in the role of a guide, in this process, gave feedback to the candidate teachers about the activities they arranged. They did this every week in a classroom setting. In the 10th week, the candidate teachers prepared their project reports and presentations and handed in the relevant people in the Special Education Centre and their course lecturers. At the end of the study, the scales of post-tests were applied and a number of interviews were carried out by the researcher with one student from each group. An appropriate environment was prepared for the learners to give accurate and sincere answers to the questions during the interviews. A voice recorder was used during the interviews, each of which lasted approximately 15-20 minutes.

1.1. Data Analysis and Interpretation

For the data analysis, the statistical SPSS program was used. The findings obtained was evaluated in a scientific frame and then interpreted accordingly. The results obtained were interpreted according to the aim of the study.

The candidate teachers formed the sample of the study. In interpreting the answers regarding the scales as negative-positive, low-high, indecisive point that is placed just in the middle of the scale is taken as a measure. Therefore, the statements or dimensions in the scale interpreted as positive if they have average points over 3 and negative if they have average points below 3. Thus, while interpreting the scores, score 3 is taken as the threshold value. In the analysis of the data, paired sample t-test, mean and percentage were used.

2. Findings

2.1. The Success Regarding Information Technologies

To identify whether there is a meaningful difference or not between the success regarding information technologies of the candidate teachers receiving m-learning education before and after the study, paired t-test is applied. The data of the test analysis are given below. In the success test, there are 50 questions in total related to the information technologies. These questions are assessed over 100. The candidate teachers answered the questions online Learning Management System.

Table 1.The Success Results Regarding the Information Technologies

| Study Group | N | Mean | SD | sd | t | P |
|-------------|----|--------|--------|----|---------|------|
| Pre-test | 56 | 62.750 | 14.426 | | | |
| Post-Test | 56 | 86.892 | 8.378 | 55 | -12.355 | .000 |

As it could be seen in Table 1, there is a meaningful ($t= 12.355$, $p<0.05$) difference between the results of the pre-test and post-test of the candidate teachers receiving mobile learning supported education. According to the findings we could conclude that these applications positively influenced the success of the students regarding information technologies. Their average level success regarding information technologies increased to higher level. Sur (2011) in his study, likewise, indicated that the use of mobile technologies in education increase the success of students positively. There is no doubt that interaction and flexibility provided by the Internet and mobile devices and their social benefits are shown among the reasons.

2.2. The Competencies of Using Mobile Technologies

The results of the analysis whether there is a meaningful difference or not regarding the ability of using mobile technologies of the candidate teachers receiving m-learning supported education before and after the studies given in Table 2. below.

Table 2.The Results of the Ability of Using Mobile Technologies

| Study Group | N | Mean | SD | sd | t | P |
|-------------|----|-------|------|----|--------|------|
| Pre-Test | 56 | 3.826 | .558 | | | |
| Post-Test | 56 | 4.317 | .580 | 55 | -6.504 | .000 |

As it is clearly observed from the table above, there is a meaningful ($t=-6.504$, $p<0.05$) difference between the pre-test and post-test results of the candidate teachers receiving mobile learning supported education regarding the ability of using mobile technologies. When the post-test data of the study is taken into consideration, it is seen that there is a positive increase in the using ability in those services by means of the mobile devices that candidate teachers use in mobile learning environment.

According to the results of the post-test, there is a meaningful increase for the candidate teachers in the direction of establishing communication between mobile technologies, interacting with the teacher, managing the projects online, having information about mobile learning applications and using these applications.

2.3. The Perceptions Regarding the Mobile Learning

The table below shows the advantages provided by the mobile learning applications for the candidate teachers. Besides, the data about the paired t-test analysis results are also shown on the table below to demonstrate whether there is a meaningful difference between the pre-test and post-test results of the perceptions regarding the usability of the mobile learning applications.

Table 3.The Results Regarding the Advantages Provided by the Mobile Learning

| | | N | Mean | SD | sd | t | P |
|--|-----------|----|-------|------|----|--------|------|
| The Advantages of M-Learning | Pre-test | 56 | 4.004 | .620 | 55 | -3.872 | .000 |
| | Post-test | 56 | 4.355 | .476 | | | |
| The Applicability of M-Learning in Lessons | Pre-test | 56 | 3.982 | .647 | 55 | -5.001 | .000 |
| | Post-test | 56 | 4.386 | .506 | | | |

As it is quite apparent from the table above, there is a meaningful correlation ($t=-3.872$, $p<0.05$) between the pre-test and post-test results of the teachers receiving mobile learning education in terms of the advantages provided by the applications after the education process was over. One could conclude from the table above that the perceptions of the candidate teachers regarding the advantages of the mobile learning positively increased.

From the findings obtained from the post-test, the candidate teachers indicated that they could reach and share the knowledge whenever they need it through the mobile devices. They also added that mobile learning applications are supportive in several ways and are also beneficial in terms of the quality of education. In addition, they stressed that mobile learning plays an efficient role in subject learning and consolidation. A similar study of Basoglu (2010) revealed similar results.

Additionally, as it is seen in Table 3, there is a meaningful difference ($t=5.001$ $p<0.05$) between the pre-test and post-test results of the candidate teachers receiving mobile learning education in terms of the usability of these applications in the lessons. From the findings obtained, we could conclude that the perceptions of the candidate teachers towards the usability of the mobile technologies in lessons increased as the result of the applications.

As it is known there is a big need for several applications for the realization of mobile learning and the preparation of the environment. It is essential for the candidate teachers to be well adapted to these applications and to be able to use them effectively. As it is obvious from the findings regarding the usability of the applications, there is a positive increase between the perceptions of the students of their pre-tests and post-tests.

When it is looked from the perspective of the usability of these applications in the lessons, candidate teachers pointed out that they could reach the information free from time and place. Besides, mobile learning applications that are used at web could also be used as support and be used to have a direct communication with the students. The candidate teachers also indicated that they learn faster by establishing quick and easy communication with their teachers and friends.

The candidate teachers' perceptions towards the advantages of mobile learning and their usability in lessons were positive before the study. However, they got meaningfully higher and thus more positive after the study.

2.4. The Views of the Candidate Teachers Regarding M-Learning Environment

In order to determine the views of the candidate teachers regarding m-learning environment, face to face meetings were held with one student from each group.

The answers of the candidate teachers to the question of "what are the advantages and limitations of this application?" in general vary: they indicated that they were prejudiced before the study since they did not use the mobile technologies for educational purposes, however; after the study, their

interests towards the lessons were increased by the use of the mobile devices in education. They also added that they had an easier way of communication with their teachers and friends and thus had more information exchange and much more permanent knowledge. Additionally, they indicated that because they were already using the mobile devices in their daily lives, they did not have any trouble using them in the lessons. They were in the belief that mobile devices removed the place problem by enabling communication out the school and thus they learnt to learn collaboratively. Besides, they stated that the mobile devices were easy to use, cheap or even free to maintain, flexible to be used by the working people. In addition, the candidate teachers said that their visits to the Special Needs Centre had positive impact on them. They added that they became very happy because of the time spent children in the center. What is more they stated that their visits to the center would continue after the project finishes.

3. Conclusion and Discussion

The current study aimed to determine the impact of mobile learning supported implementations on the success in information technology courses, their mobile learning perceptions of the students of mentally disadvantaged it is found that there is a meaningful increase in the positive sense concerning their success towards information technologies before and after the implementation. According to the findings obtained from the interviews, the students are in a belief that their knowledge about the information technologies would be considerably useful for their daily lives as well as reaching the knowledge.

Internet is known as one of the most important tools for an individual's personal development almost in every field. Therefore, it is not surprising that there is a need to be knowledgeable in the field of information technologies in order to be able to use the Internet effectively in Special Education. The findings obtained from the study show that the students could improve themselves in almost every field and could also reach knowledge by means of the knowledge gained in this field. If the fact that this study group is future Special Education teachers is taken into consideration, one could conclude that information technologies would have an important place in their future careers.

The candidate teachers indicated that the implementation environment is quite useful and entertaining. They pointed out that they learnt many things by means of the projects they carried out throughout the implementation process. Additionally, they indicated that what they experienced in the Special Education Centre along with the implementations they carried out are quite significant experiences for them. As the result of the evaluations, the students in the study group did not stop their visits to the Special Education Centre after the study was over. They also increased their social interactions with special education students, their families and teachers.

The findings indicated that the perception and competence levels of the candidate teachers increased after the study. It could be easily seen that the competencies of using mobile learning implementations reached the highest level. It is also obvious that their competencies concerning use of mobile devices increased.

In addition, the findings clearly showed that candidate teachers strongly hold the idea that there would be more effective learning when the traditional learning is supported by the m-learning environment. When the views concerning to this taken into account, we could conclude that candidate teachers took the photographs of the implementations they carried out with teachers and families, did sound and video recording and shared them right away with their group friends. Thus, the students were in a continuous interaction with each other.

While many researchers talk about the positive effects of mobile learning, others mention the problems encountered during the mobile learning process. Small screens and limited memories, for

instance, are among the problems faced. Therefore, it is planned to remove problems by using laptops and notebooks on SkyDrive environment.

SkyDrive system has a cross platform that enables its use on desktop computers and mobile devices. Moreover, students can work on the platform without the need of a continuous Internet connection and only go online when their studies are synchronised (Ozdamli, 2013). SkyDrive and many other similar cloud computing systems could be obtained over the Internet free of charge.

As in every research, there were a number of limitations to this study. The first limitation relates to the sample size of the study. Nevertheless, it is the authors' suggestion that any further research in this area should strive for larger sample sizes so that more elaborate analysis can be performed and the studies should be longitudinal. The other limitation relates to speed internet connection in the faculty. Students have 3g connections but sometimes it is not enough for downloading materials. The Internet within the campus could increase the speed.

In conclusion, the results indicated that mobile learning approaches and cloud computing software support flexibility in place and time of learning could increase learners' success, competencies and perceptions.

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